

What is claimed is:

1. A method for determining the thickness of material by penetrating the material, in particular a method for measuring the thickness of walls, ceilings and floors, with which a measurement signal (28) in the gigahertz frequency range emitted using a high-
5 frequency transmitter (24) penetrates the material (10) to be investigated at least once and is detected by a high-frequency receiver (38),
wherein
the thickness (d) of the material (10) is measured via at least two transit-time measurements of the measurement signal performed at various positions (20, 22) of the
10 high-frequency transmitter (24) and/or the high-frequency receiver (34).
2. The method as recited in Claim 1,
wherein
the high-frequency transmitter (24) and the high-frequency receiver (38) are operated on a first surface (14) of the material (10), and the measurement signal (28) from the
15 high-frequency transmitter (24) is reflected back to the high-frequency receiver (38) by a reflector means (18).
3. The method as recited in Claim 2,
wherein,
the reflector means (18) includes a transponder (40, 140, 240, 340).
- 20 4. The method as recited in Claim 1, 2 or 3,
wherein
the high-frequency transmitter (24) and the high-frequency receiver (38) are operated in the same device (12), in particular a hand-held device.
5. The method as recited in Claim 4,
25 wherein
the measuring device (12) is moved over a surface (14) of the material to record the at least two transit-time measurements.
6. The method as recited in Claim 5,

wherein,

the displacement path (s) of the measuring device (12) is detected.

7. The method as recited in Claim 1,

wherein

5 the measurement signal (28) is generated in the gigahertz frequency range using a pulsed-radar method and is launched into the material (10).

8. The method as recited in Claim 1 or 7,

wherein

10 one or more measurement frequency/frequencies (28) are used in an interval of 1000 MHz to 5000 MHz, and preferably in an interval of 1500 MHz to 3500 MHz.

9. A device system for carrying out the method as recited in one of the Claims 1 through 9,

wherein

15 the device includes at least one high-frequency measuring device (12) capable of being placed on a surface (14) of a material (10), with at least one high-frequency transmitter (24) and a high-frequency receiver (38), and a transponder (40, 140, 240, 340) capable of being moved relative to this high-frequency measuring device.

10. The system as recited in Claim 9,

wherein

20 the high-frequency measuring device (12) includes a position-detection system (50, 52) for recording a path (s).